825.341

ANALYTICAL RESULTS OF SURFACE WATER SAMPLES COLLECTED FROM RACCOON CREEK

July 22, 1999 Sampling Event

Prepared for

Lyondell Chemical Worldwide Inc.
Beazer East, Inc.

Prepared by

Applied Hydrology Associates, Inc.
Pittsburgh, PA
Denver, CO

August 18, 1999

Applied Hydrology Associates, Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION

This report presents the results of surface water samples collected from Raccoon Creek at the Lyondell Chemical Worldwide, Inc. / Beazer East Inc. Monaca, PA site during the July 22, 1999 quarterly monitoring event. The samples were collected in compliance with Appendix D of the 1997 Consent Order and Agreement (1997 CO&A) between ARCO Chemical Company[1], BEI and the Pennsylvania Department of Environmental Protection (PADEP) dated October 20, 1997.

2.0 SAMPLING

Surface water samples were collected at Transect E as defined in the 1997 CO&A. The location of Transect E is shown in Figure 1. In addition, water elevations were measured in nearby monitoring wells and the results are presented in Appendix A.

A total of eight surface water samples, including a duplicate were collected from Raccoon Creek on July 22, 1999. These samples were collected at the same three locations along Transect E as in previous sampling events. The locations are shown in Figure 2 and are at the center of the stream, and approximately 30 feet from the east and west banks. At the center location, samples were collected at three depths; 6 inches below the surface, 2 inches above the bottom, and midway between the surface and bottom. Samples from the east and west sides of the transect were collected at two depths; 2 inches above the bottom, and midway between the surface and bottom.

During sampling a boat was stationed at Transect E using a rope secured to the east and west shores of Raccoon Creek. The samples were collected by using a peristaltic pump to pump water from the desired depth into three 40-ml vials preserved with hydrochloric acid. Samples were collected from the required depths utilizing tubing secured to a vertical steel rod lowered from the boat until it rested on the bottom of the creek. The rod did not penetrate the sediments on the creek bottom because a 1-foot diameter disc constructed of steel mesh is fastened perpendicular to the bottom of the rod.

Two tubes were used. The bottom of the "deep sample tube" was secured to the probe 2 inches from the bottom of the probe. The bottom of the "mid-depth sample tube" is adjustable and was secured to the probe mid-depth at each location. Care was taken not to disturb the sediments at the sampling location and the pumped water was closely monitored to ensure sediment was not included in the sample. One gallon of water was pumped through the tubing before each sample was obtained in order to purge the tubing.

[1] ARCO Chemical Company is now Lyondell Chemical Worldwide

The samples were uniquely numbered as follows to identify the location, depth and date of sampling:

RC-EC-00-0799

Where:

RC	indicates Raccoon Creek
EC	indicates Transect E and location (C = center, L = left bank, R = right bank [facing downstream])
00	indicates sample depth in feet and tenths of a foot (0.0 feet)
0799	indicates the month and year collected (July 1999)

Samples were logged onto a chain of custody form (included in of the Analytical Report in Appendix B) and stored on ice until receipt by Reliance Laboratories Inc. in Edison, NJ. Reliance analyzed the samples using USEPA Method 524.2 for BTEXS.

3.0 RESULTS

The analytical results are presented in Table 1. No BTEXS constituents were detected in any of the eight samples. Sampling locations and depths are shown on Figure 2, along with the concentration of benzene at each location. Water levels in wells near Raccoon Creek are presented in Appendix A.

Table 1
Summary of Analytical Results for Samples Collected from Raccoon Creek

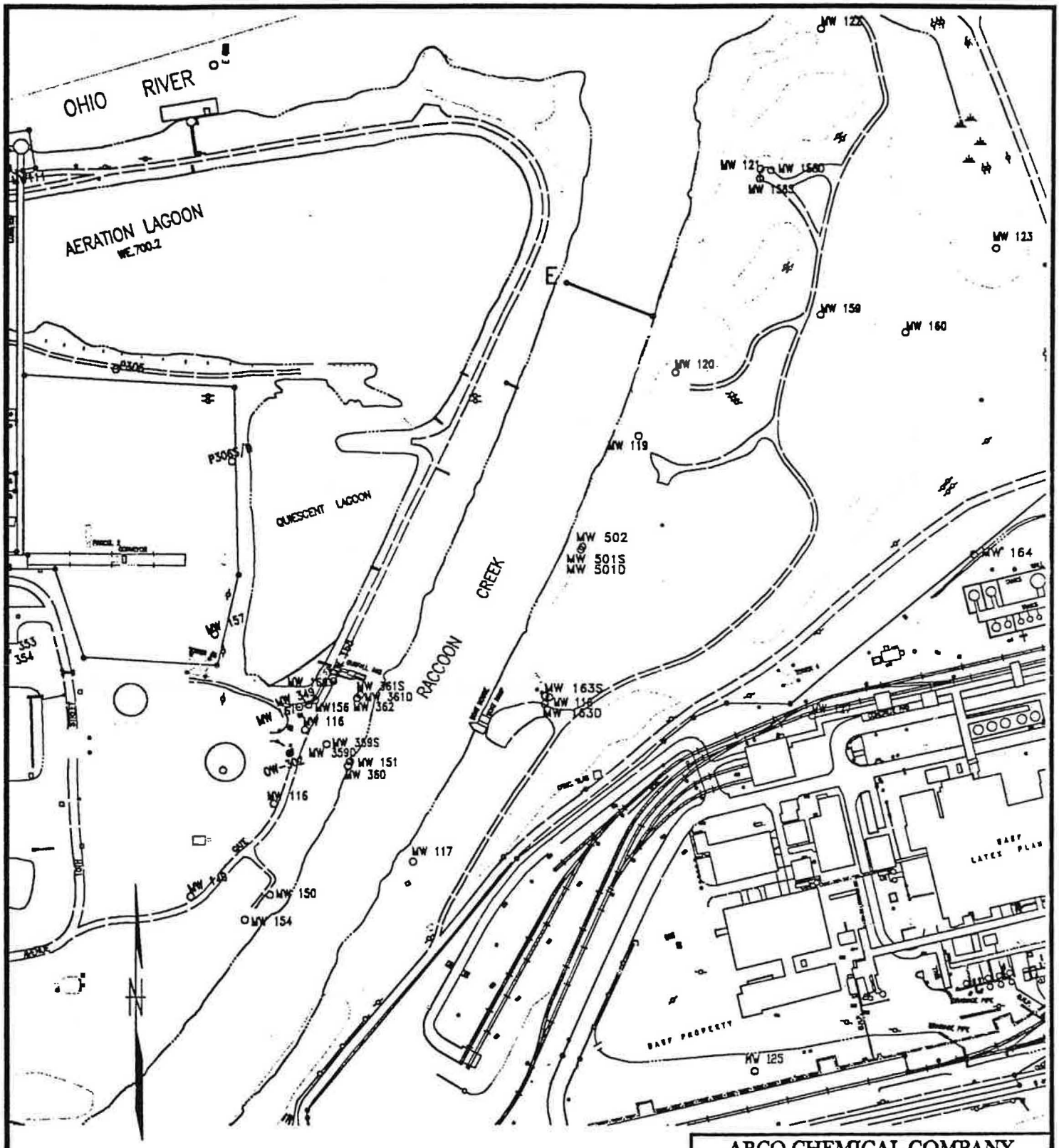
Sample Name	Benzene	Toluene	Ethylbenzene	Xylene	Styrene
RC-EL-24-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EL-12-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-00-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-00-0799A	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-35-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-71-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-ER-34-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-ER-68-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58

The analytical data were validated upon receipt and found to be acceptable. A Data Validation Report is provided in Appendix B. Table 2 presents the historical concentration of benzene in Raccoon Creek at Transect E during all monitoring events to date.

Historic Benzene Concentrations at Transect E
(ug/L)

Sampling Location	Sampling Depth	7/23/97	10/28/97	2/25/98	5/21/98	7/29/98	10/27/98	2/3/99	4/27/99	7/22/99
30 Feet off West Bank	Mid-depth	0.28	<0.13	<0.13	0.70	<0.13	1.57(1)	0.37	< 0.66	<0.13
30 Feet off West Bank	Deep	0.81	<0.13	<0.13	0.70	<0.13	0.61(1)	0.49	< 0.66	<0.13
Center of Creek	Shallow	0.24	<0.13	0.38	0.70	<0.13	<0.13	0.61(1)	< 0.66(1)	<0.13(1)
Center of Creek	Mid-Depth	0.18	<0.13	0.49	0.64	<0.13	0.2	0.64	< 0.66	<0.13
Center of Creek	Deep	0.46	<0.13	0.30	0.60	<0.13	<0.13	0.69	< 0.66	<0.13
30 Feet off East Bank	Mid-depth	0.16	<0.13	<0.13	<0.13	0.13	0.52	< 0.13	< 0.66	<0.13
30 Feet off East Bank	Deep	<0.13	<0.13	0.14	0.22	0.22	<0.13	< 0.13	< 0.66	<0.13

(1) Results shown are the average of the blind duplicate samples.

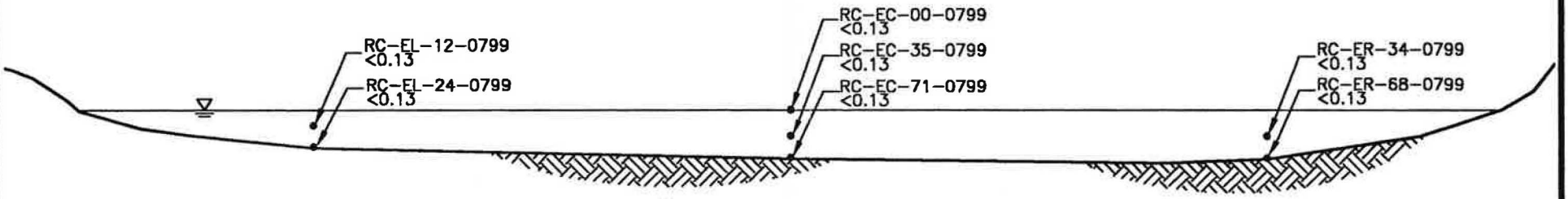


Applied Hydrology Associates, Inc.

ARCO CHEMICAL COMPANY
BEAVER VALLEY PROPERTY
RACCOON CREEK QUARTERLY MONITORING

FIGURE 1 TRANSECT AND MONITORING WELL LOCATIONS

DESIGN SM	DATE 8/27/98	FILE REFERENCE	
DRAWN MJZ	SCALE	TRANSECT.DWG	
CHECKED	APPROVED	PROJECT NO. 36-5	PAGE NO.



CREEK SECTION
LOOKING DOWNSTREAM

LEGEND

- SURFACE WATER SAMPLE LOCATION

ALL CONCENTRATIONS IN ug/L

20' 0 20'
SCALE IN FEET

Applied Hydrology Associates, Inc.

LYONDELL CHEMICAL WORLDWIDE
BEAVER VALLEY PROPERTY
RACCOON CREEK QUARTERLY MONITORING

FIGURE 2

SURFACE WATER BENZENE CONCENTRATIONS AT TRANSECT 'E'

JULY 22, 1999

SM	8/17/98		
JLS	NOT TO SCALE	BENZENE.dwg	
		38-5	

Appendix A

Groundwater Elevations, East and West Sides of Raccoon Creek

GROUNDWATER LEVELS ON THE EAST AND WEST SIDES OF RACCOON CREEK
July 22, 1999

Well Number	Top of Casing (TOC) (ft. amsl)	Depth to SPL from TOC (2) (ft. amsl)	Depth to Water from TOC (2) (ft. amsl)	Calculated Water Level Elevation (1) (ft. amsl)	Calculated SPL Thickness (3) (ft. amsl)	Comments
Monitoring Wells Screened in Silty Clay Unit						
OTH AREA						
MW - 360	685.84	ND	2.39	683.45	N/A	
MW - 170	706.70	ND	22.44	684.26	N/A	
MW - 362	689.43	ND	5.91	683.52	N/A	
RACCOON CREEK AREA						
MW- 118	690.39	ND	7.00	683.39	N/A	Monitoring well is dry. Screened above water table. Bottem of well is 7.00 feet below TOC.
MW - 502	701.86	ND	18.62	683.24	N/A	
MW - 119	705.59	ND	22.32	683.27	N/A	
MW - 120	709.42	ND	26.10	683.32	N/A	
MW - 121	713.90	ND	30.58	683.32	N/A	
MW - 152	696.35	ND	13.06	683.29	N/A	
Monitoring Wells Screened in Upper Sand and Gravel Unit						
OTH AREA						
MW - 344	709.42	ND	25.63	683.79	N/A	
MW - 359S	692.93	ND	9.46	683.47	N/A	
MW - 361S	689.40	ND	6.00	683.40	N/A	
MW - 169	707.93	ND	28.58	679.35	N/A	Well had excessive pressure build up from OTH Sparge event (7/13/99 - 7/14/99).
MW - 167	711.06	ND	27.57	683.49	N/A	Top of casing changed from 707.36 to 711.06 on 11/98 to accommodate respiration monitoring well head. Monitoring well stick up is 3.70 above orig. TOC
RACCOON CREEK AREA						
MW - 163S	690.87	ND	7.56	683.31	N/A	
MW - 501S	701.30	ND	18.31	682.99	N/A	
MW - 162S	706.05	ND	22.80	683.25	N/A	
MW - 159	708.99	ND	25.71	683.28	N/A	
MW - 160	701.00	ND	17.69	683.31	N/A	
MW - 158S	713.60	ND	30.34	683.26	N/A	
MW - 122	692.78	ND	9.55	683.23	N/A	
Note: See figure 1						
(1) Calculated values, based on Elevation of TOC minus Depth to Water from TOC.						
(2) Measured from top of casing using the MMA Interface Probe. ND means no SPL was detected.						
(3) Calculated values, based on Depth to Water from TOC minus Depth to SPL from TOC. N/A means not applicable, no SPL was detected.						

GROUNDWATER LEVELS ON THE EAST AND WEST SIDES OF RACCOON CREEK
July 22, 1999

Well Number	Top of Casing (TOC) (ft. amsl)	Depth to SPL from TOC (2) (ft. amsl)	Depth to Water from TOC (2) (ft. amsl)	Calculated Water Level Elevation (1) (ft. amsl)	Calculated SPL Thickness (3) (ft. amsl)	Comments
Monitoring Wells Screened in Lower Sand and Gravel Unit						
OTH AREA						
MW 345	708.91	ND	25.60	683.31	N/A	
MW 361D	689.35	ND	5.91	683.44	N/A	
MW 359D	692.80	ND	9.43	683.37	N/A	
RACCOON CREEK AREA						
MW 163D	689.62	ND	6.25	683.37	N/A	
MW 501D	701.44	ND	18.17	683.27	N/A	
MW 166D	703.95	ND	20.64	683.31	N/A	
MW 158D	712.04	ND	28.86	683.18	N/A	

Water Levels in Raccoon Creek and Ohio River				
RACCOON CREEK AREA STAFF GAUGE				
Time of Observation	**Staff Gauge Elevation (ft. amsl) (4) (5)**	**Staff Gauge Reading**	**Calculated Water Level Elevation (ft. amsl)**	**Comments**
10:25	685.00	1.80	683.80	
11:24	685.00	1.80	683.80	
OHIO RIVER. STAFF GAUGE				
7:56	685.96	3.10	683.06	
11:13	685.96	3.12	683.08	

Note: See figure 1

(1) Calculated values, based on Elevation of TOC minus Depth to Water from TOC.

(2) Measured from top of casing using the MMA Interface Probe. ND means no SPL was detected.

(3) Calculated values, based on Depth to Water from TOC minus Depth to SPL from TOC. N/A means not applicable, no SPL was detected.

(4) Elevation 685.00 is equivalent to 3.00 mark on staff gauge at Raccoon Creek

(5) Elevation 685.96 is equivalent to 6.00 mark on staff gauge at Ohio River

Appendix B

Data Validation Report

Applied Hydrology Associates, Inc.

1200 South Parker Road, Suite 100 Denver, CO 80231 Tel: (303) 873-0164 Fax: (303) 873-6110

M E M O R A N D U M

TO: **Files**
FROM: **Skip Meier, Applied Hydrology Associates**
DATE: **August 17, 1999**
SUBJECT: **Data Validation Results, Lyondell Chemical Worldwide Beaver Valley Property**

Data validation was performed on the volatile organic analytical data from eight surface water samples obtained from Raccoon Creek on July 22, 1999 and also on a Rinsate Blank and Trip Blank. The validation was performed in accordance with the "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review". Reliance Laboratories Inc. performed the analysis using EPA Method 524.2. The samples reviewed included:

Field Sample ID	Lab Sample ID
RC-EL-24-0799	R-6267.3
RC-EL-12-0799	R-6267.4
RC-EC-00-0799	R-6267.7
RC-EC-00-0799A	R-6267.8
RC-EC-35-0799	R-6267.6
RC-EC-71-0799	R-6267.5
RC-ER-34-0799	R-6267.2
RC-ER-68-0799	R-6267.1
Rinsate Blank	R-6267.9
Trip Bland	R-6267.10

Items reviewed and actions taken were as follows:

√ **Method:**
The ten samples were analyzed for BTEXS by method USEPA 524.2 on July 23, 1999.

√ **Holding Time:**
All Samples were analyzed within the 14-day holding time.

√ **Blanks:**
No target compounds were detected in the associated method blank.

√ **System Monitoring Compounds:**
The "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" indicate that "Recoveries for system monitoring compounds in volatile samples and blanks must be within the limits specified in the Method." However, Method 524.2 does not specify a required

recovery. Nevertheless, 4-bromofluorobenzene and 1,2-dichlorobenzene-d4 surrogate recoveries were within 96-122 percent and this is acceptable.

√ **Internal Standards:**
All fluorobenzene internal standards were within the established criteria for area internal standard and retention time.

√ **GC/MS Instrument Performance Check:**
All bromofluorobenzene (BFB) tunes met the ion abundance criteria. Analysis of the instrument performance check solution was performed at the beginning of each 12-hr period during which the samples were analyzed.

√ **Initial Calibrations:**
The initial calibration performed on July 23, 1999 for Instrument HP5971A met the 30 percent relative standard deviation (RSD) and 0.05 minimum relative response factor criteria for all compounds.

√ **Continuing Calibrations:**
Continuing calibration was run and compared to the correct initial calibration. All continuing calibrations met the 25 percent difference and minimum relative response factor criteria for all compounds.

√ **Matrix Spike/Duplicate:**
The matrix spike/duplicate results for recovery and RPD were within the Quality Control limits.

√ **Target Compound Indentification/Quantitation:**
No problems were identified with compound identification or quantities.

√ **Field Duplicate:**
A field duplicate was collected during this sampling event. The duplicate sample was denoted by an "A" at the end of the sample name. The pair is RC-EC-00-0799 and duplicate RC-EC-00-0799A. Table 1 below summarizes the RPD for the sample/duplicate pair, indicating that no BTEXS compounds were detected for either the primary sample or the duplicate.

Table 1: Relative Percent Difference (RPD)

Sample Name	Benzene (ppb)	RPD (%)	Toluene (ppb)	RPD (%)	Ethyl-Benzene (ppb)	RPD (%)	Xylene (ppb)	RPD (%)	Styrene (ppb)	RPD (%)
RC-EC-00-0799	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA
RC-EC-00-0799A	ND	NA	ND	NA	ND	NA	ND	NA	ND	NA

ND = Non Detect
NA = Not Applicable

√ **Summary:**
No inconsistencies were noted. No BTEXS constituents were detected in the duplicate sample pair RC-EC-00-0799 and RC-EC-00-0799A (See Table 1). No BTEXS compounds were detected in either the trip blank or the field blank.

RELIANCE
LABORATORIES, INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
EMAIL: 74201.3501@COMPUSERVE.COM

ANALYTICAL DATA REPORT

for

Lyondell Chemical
Monaca, PA - 15061
Project: AHA / Monaca

Date Received: 7/23/99

Sample ID	Lab ID #
RC-ER-68-0799	R-6267.1
RC-ER-34-0799	R-6267.2
RC-EL-24-0799	R-6267.3
RC-EL-12-0799	R-6267.4
RC-EC-71-0799	R-6267.5
RC-EC-35-0799	R-6267.6
RC-EC-00-0799	R-6267.7
RC-EC-00-0799A	R-6267.8
Rinsate Blank	R-6267.9
Trip Blank	R-6267.10

These samples have been analyzed by EPA method 524.2 for a selected compound list. The results are not designed for use for drinking water purposes.

G. P. Kirpalani
Manager

GPK/vb

RELIANCE
LABORATORIES INC.

3090 WOODBRIDGE AVENUE, EDISON NJ 08837 PH (908) 738-5454 FAX (908) 738-5841

REDUCED LABORATORY DATA DELIVERABLES

		Check if Complete
I.	Cover Page, Format, and Laboratory Certification (Include Cross Reference Table of Field I.D. and Lab I.D)	✓
II.	Chain of Custody	✓
III.	Summary Sheets listing analytical results Including QA Data Information	✓
IV.	Laboratory Chronicle and Methodology	✓
V.	Initial Calibration and Continuing Calibration	✓
VI.	Tune Summary (MS)	✓
VII.	Blank Summary	✓
VIII.	Surrogate Recovery Summary	✓
IX.	Chromatograms / IR Spectra	✓
X.	Internal Standard Summary (MS)	✓
XI.	Matrix Spike / Spike Duplicate Summary	✓
XII.	Non-Conformance Summary	✓

Laboratory Manager
Signature

7/28/99
Date

RELIANCE
LABORATORIES, INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
EMAIL: 74201.3501@COMPUSERVE.COM

LABORATORY CHRONICLE

Customer Name Lyondell Chemical
Date Received: 7/23/99
Date Sampled: 7/22/99
Sample ID: As per chain of custody

Organic Extraction:

1 Acids _____
2 Base / Neutrals _____
3 Pesticides/PCB's _____
4 TPHC _____

Analysis:

1 Volatiles 7/23/99
2 Acids _____
3 Base/Neutrals _____
4 Pesticides/PCB's _____
5 TPHC _____

Inorganics:

1 Metals _____
2 Cyanides _____
3 Phenols _____

Other Analysis:

_____
_____

Supervisor
Review & Approval _____

RELIANCE
LABORATORIES INC.

3090 WOODBRIDGE AVENUE, EDISON NJ 08837 PH (908) 738-5454 FAX (908) 738-5841

NON-CONFORMANCE SUMMARY

Reliance Labs received 10 water sample including blanks for BTEXS by method (EPA 524.2) from Lyondell Chemical on 23 July 1999. Samples consisted of 10 vials.

Matrix spike recovery analysis was performed on diluted sample since not enough sample was provided.

All analyses were performed within the required holding time.

STANDARD OPERATING PROCEDURE
METHOD 524.2

1. Scope

This is the general method for the procedure used to identify purgeable volatile organics in portable water. The sample is purged with ultra high purity helium and concentrated into a trap. The volatiles are then thermally desorbed onto a megabore column and identified using a mass spectrometer detector.

2. Equipment and Apparatus

A. Sample containers- 40ml screw caps amber vials.

B. Purge and Trap System.
   1. 25cm VOCARB 3000 trap.

C. Glassware
   1. 20 ml fritted purging vessels.
   2. 25 ml teflon sealed syringe with lever lock assembly.
   3. 10 µL syringes.

D. Gas Chromographic / Mass Spectrometer.
   1. Column type J&W
      75 m, 0.53 mm ID, DB624 3 microns

E. Apparatus Conditions
   1. Tekmar (purge and trap)

a.	Purge time	:	2 min.
b.	Desorb time and temp.	:	250° for 2 min.
c.	Bake time and temp.	:	260° for 12 min.
d.	Flow rate	:	15 cc/min.

   2. GC Conditions

a.	Column flow	15 cc/min.
b.	Initial temp.	35° C
c.	Ramping Rate	6° C/min.
d.	Final temp.	200° C
e.	Run time	47.25 min.
f.	Initial time	6 min.

3. Stock Standards

A. Internal Standard
   1. Flourobenzene

B. Surrogates
   1. 1,2-dichlorobenzene-d4
   2. 4-bromoflurobenzene

C. Prepare standard solutions for all target compounds and surrogates at 20 ppm.

D. Prepare internal standard at 20 ppm in methanol.
   1. Prepare all standards and store in teflon sealed 1 ml vials.

4. Run Sequence

A. Tune Instrument

1. Inject 1μL of 25 ppm BFB into GC.
   a. Tune must pass against criteria.
   b. Tune must be run before any samples, blank or calibrations can be run.
   c. From time to tune 12 hours are available to run all QC data and samples.

B. Three Point Calibration Curve

1. Purge five (3) concentrations of standard solutions containing all the target analysis at 1 ppb, 2 ppb, 5 ppb.
2. The above standard must be run within 12 hours of injecting the BFB tune.
3. Created a calibration curve with the above standard runs.
   a. If the 30% RSD deviation is exceeded the standards must be run again (still within 12 hours)
4. Create an identification file from this calibration curve for automated quantification.

C. If time remains in the 12-hour run period go to step F.

D. If the 12-hour period has expired, a new tune must be injected and a new sequence must be started.

E. Once an initial calibration curve is established a continuing calibrations check may be run. A continuing calibration check is required every time the mass spectrometer is tuned.

1. 2 ppb concentration of all target compounds is purged and quanted against current ID file.
2. Check the response factors of this run against the average RF of the calibration file. The RF of the continuing calibration must be within ± 50% D (difference) of the 5 point for all compounds.
3. The area counts of internal standard and surrogates must not be decreased by >30% from the most recent continuing calibration standard nor decrease by >50% from the initial calibration standard.

F. Daily Blank

1. Purge 20 ml of laboratory reagent water (nanopure) with 5 ppb internal standard and 5 ppb each surrogate.
2. Run this blank and quant against current ID file.
3. If blank does not meet criteria, it must be rerun before analyzing any samples.

G. Samples

1. Fill 25 ml syringe until it overflows with sample. Then adjust the volume to 20 ml exactly.
2. Inject 5 μl each 25 ppm internal standard and surrogate standard solution into each sample.
3. Run and quant against the current 5 point calibration curves.
4. Any sample with target compound over 5 ppb must be rerun at the appropriate dilution.
5. Any sample not injected in 12-hour period must be rerun.

H. Quality Control Sample (QCS)

1. Analyze a QCS from an external source at least quarterly.

R E L I A N C E
LABORATORIES INC.

175 MAY STREET, EDISON, NJ 08837 PH (732) 738-5454 FAX (732) 738-5841
EMAIL : 74201.3501@COMPUSERVE.COM

LABORATORY ID
NJ DEP NO. 12687
PA DER NO. 68437

CERTIFICATE OF ANALYSIS

Customer: Lyondell Chemical
Sample: Aqueous Samples
Date Sampled: 22 July 1999
Lab ID: R-6267
Reference: **AHA / Monaca**

26 July 1999

Units: µg/L

Sample ID	Benzene	Toluene	Ethylbenzene	Xylene	Styrene
RC-ER-68-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-ER-34-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EL-24-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EL-12-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-71-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-35-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-00-0799	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
RC-EC-00-0799A	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
Rinsate Blank	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58
Trip Blank	< 0.13	< 0.6	< 0.22	< 0.22	< 0.58

G. P. Kirpalani
Manager

Quantitation Report

Data File : c:\hpchem\1\data\v6287.d
Acq On : 23 Jul 99 1:38 pm
Sample : R-6267.1
Misc : AHA - RC-ER-68-0799
Quant Time: Jul 26 9:08 1999

Vial: 9
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	12.55	96	893237	5.00 ug/L	-0.01
System Monitoring Compounds					%Recovery
43) 4-bromofluorobenzene	25.70	95	238029	5.09 ug/L	101.82%
55) 1,2-dichlorobenzene-d4	30.90	152	148753	5.11 ug/L	102.23%
Target Compounds					Qvalue

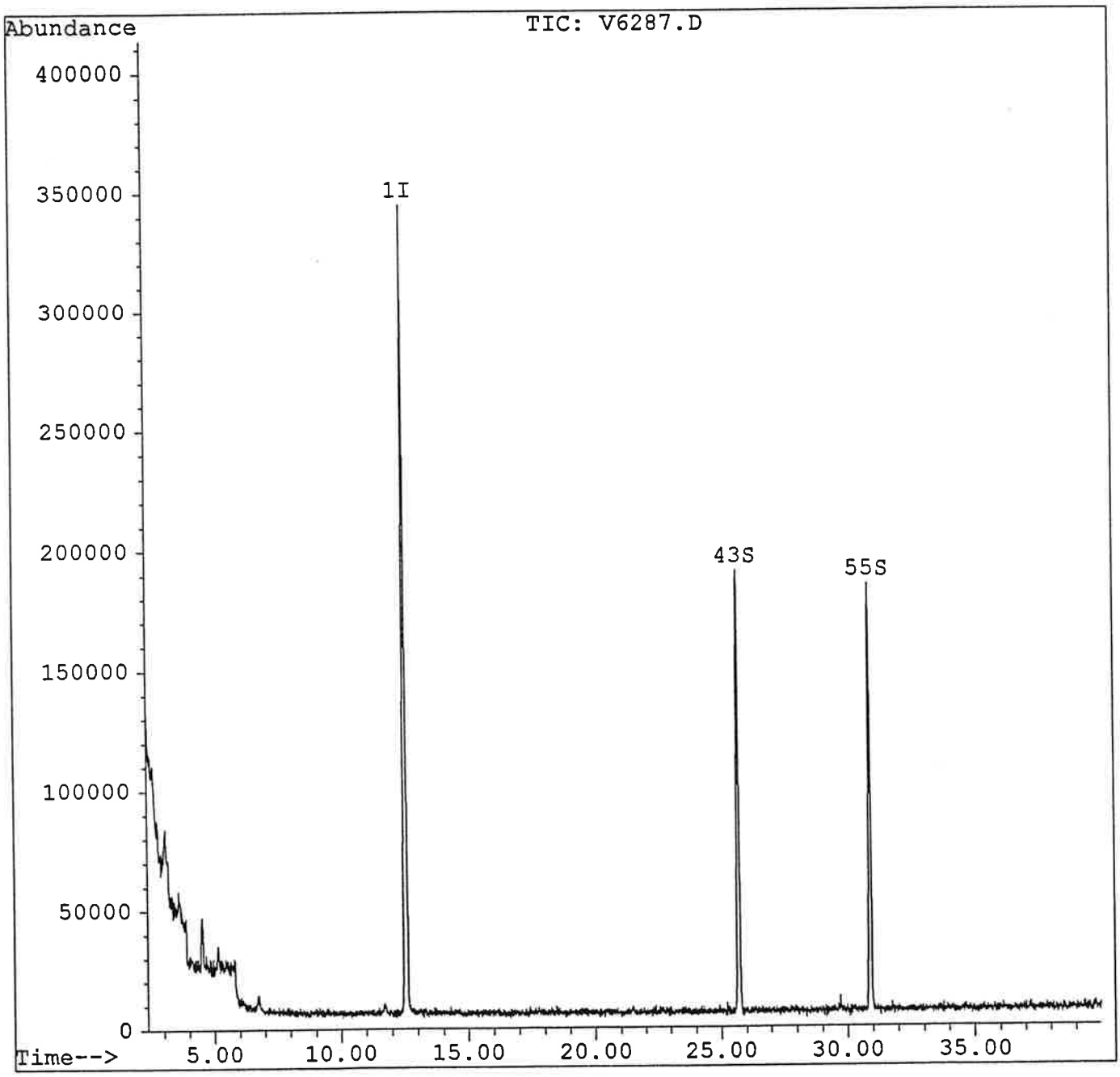
(#) = qualifier out of range (m) = manual integration
v6287.d RUN524.M Mon Jul 26 09:09:04 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6287.d
Acq On : 23 Jul 99 1:38 pm
Sample : R-6267.1
Misc : AHA - RC-ER-68-0799
Quant Time: Jul 26 9:08 1999

Vial: 9
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



307

Quantitation Report

Data File : c:\hpchem\1\data\v6288.d
Acq On : 23 Jul 99 2:23 pm
Sample : R-6267.2
Misc : AHA - RC-ER-34-0799
Quant Time: Jul 26 9:09 1999

Vial: 10
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.55	96	856616	5.00	ug/L	0.00
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.69	95	228539	5.10	ug/L	101.94%
55) 1,2-dichlorobenzene-d4	30.90	152	143444	5.14	ug/L	102.80%
Target Compounds						Qvalue

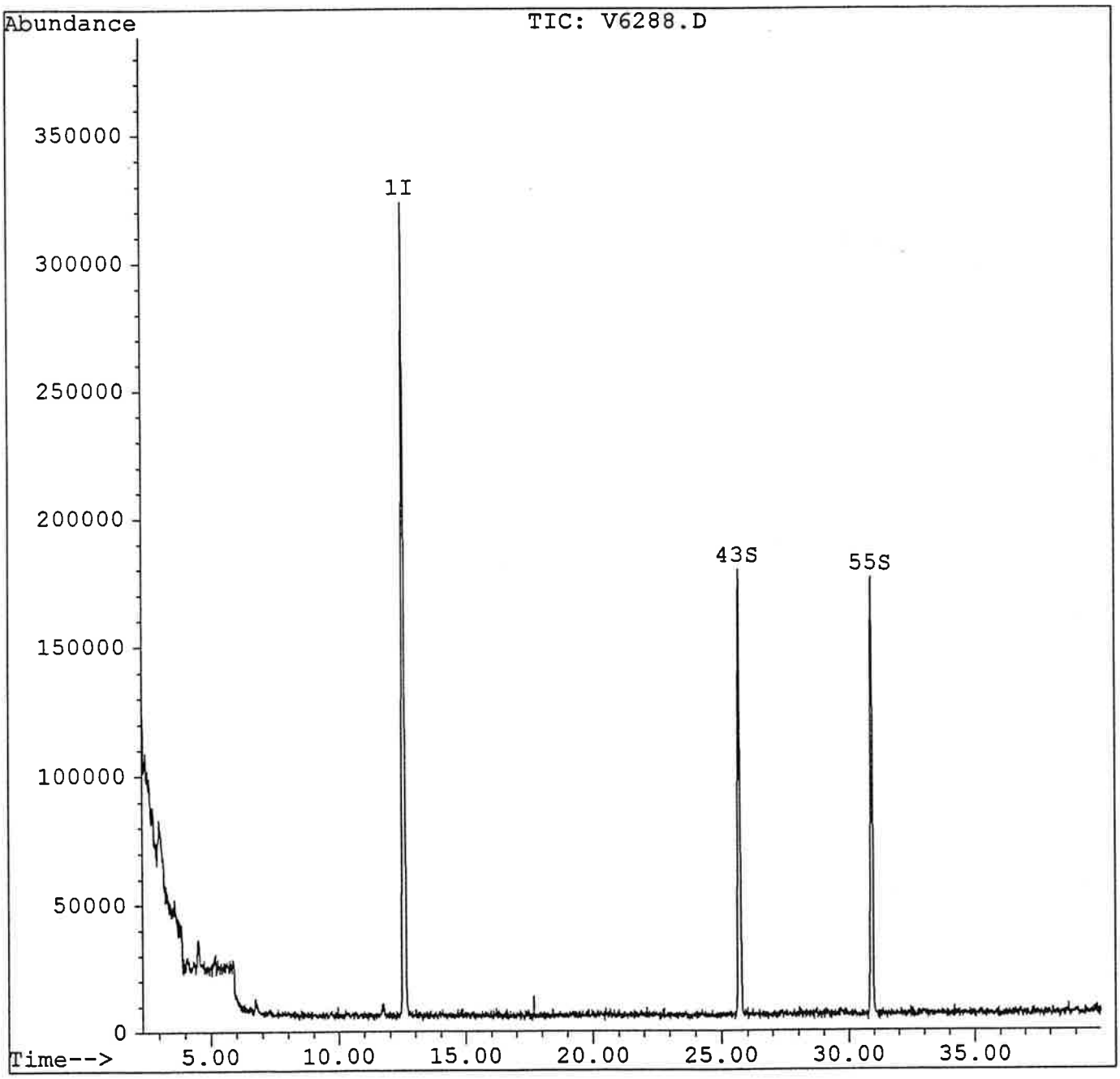
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6288.d
Acq On : 23 Jul 99 2:23 pm
Sample : R-6267.2
Misc : AHA - RC-ER-34-0799
Quant Time: Jul 26 9:09 1999

Vial: 10
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6289.d
Acq On : 23 Jul 99 3:10 pm
Sample : R-6267.3
Misc : AHA - RC-EL-24-0799
Quant Time: Jul 26 9:09 1999

Vial: 11
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	12.56	96	885470	5.00 ug/L	0.00
System Monitoring Compounds					%Recovery
43) 4-bromofluorobenzene	25.69	95	234115	5.05 ug/L	101.02%
55) 1,2-dichlorobenzene-d4	30.90	152	145315	5.04 ug/L	100.74%
Target Compounds					Qvalue

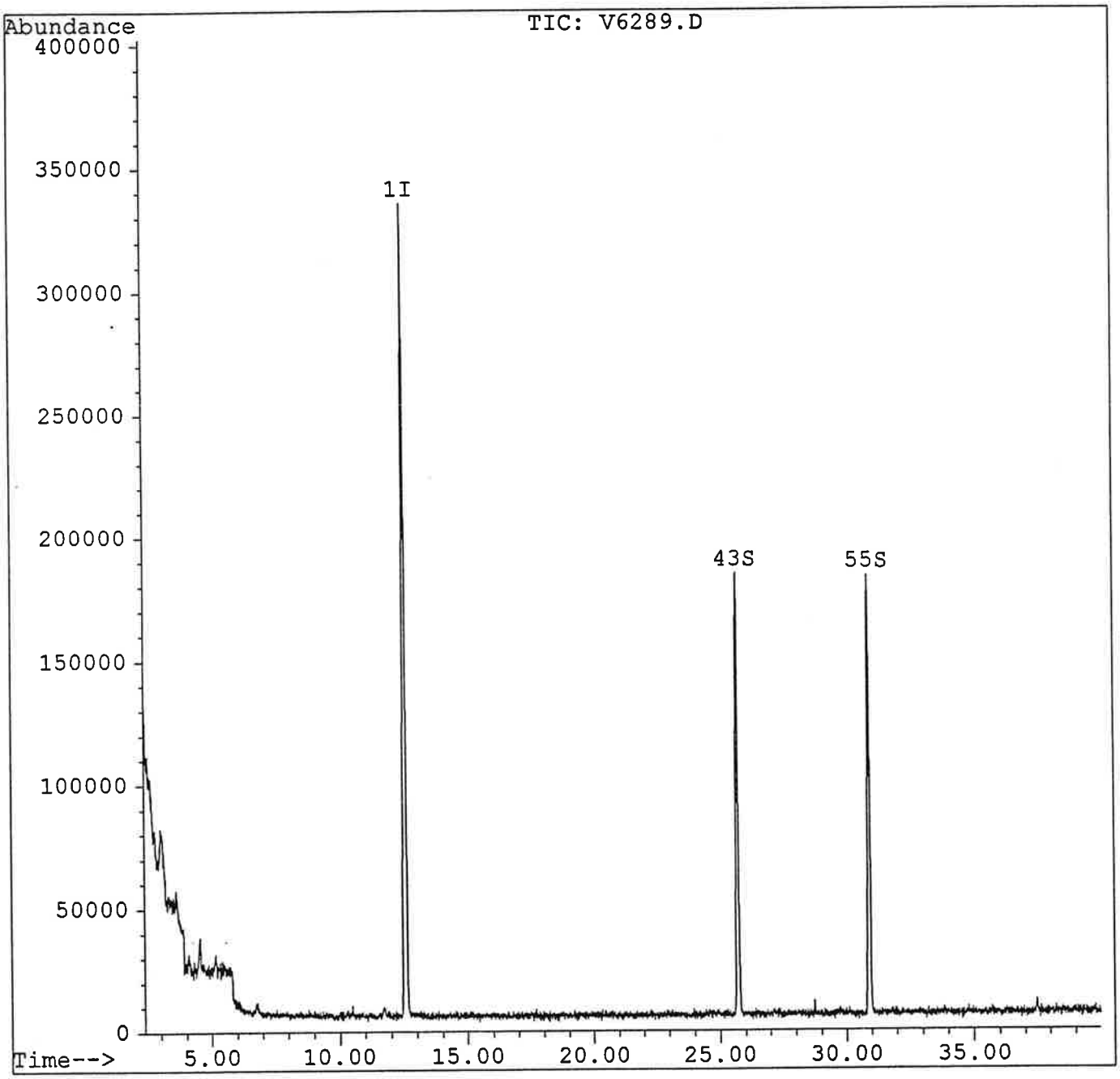
(#) = qualifier out of range (m) = manual integration
v6289.d RUN524.M Mon Jul 26 09:10:03 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6289.d
Acq On : 23 Jul 99 3:10 pm
Sample : R-6267.3
Misc : AHA - RC-EL-24-0799
Quant Time: Jul 26 9:09 1999

Vial: 11
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



311

Quantitation Report

Data File : c:\hpchem\1\data\v6290.d
Acq On : 23 Jul 99 3:55 pm
Sample : R-6267.4
Misc : AHA - RC-EL-12-0799
Quant Time: Jul 26 9:10 1999

Vial: 12
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.54	96	849200	5.00	ug/L	-0.02
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.70	95	234296	5.27	ug/L	105.42%
55) 1,2-dichlorobenzene-d4	30.91	152	145039	5.24	ug/L	104.85%
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration

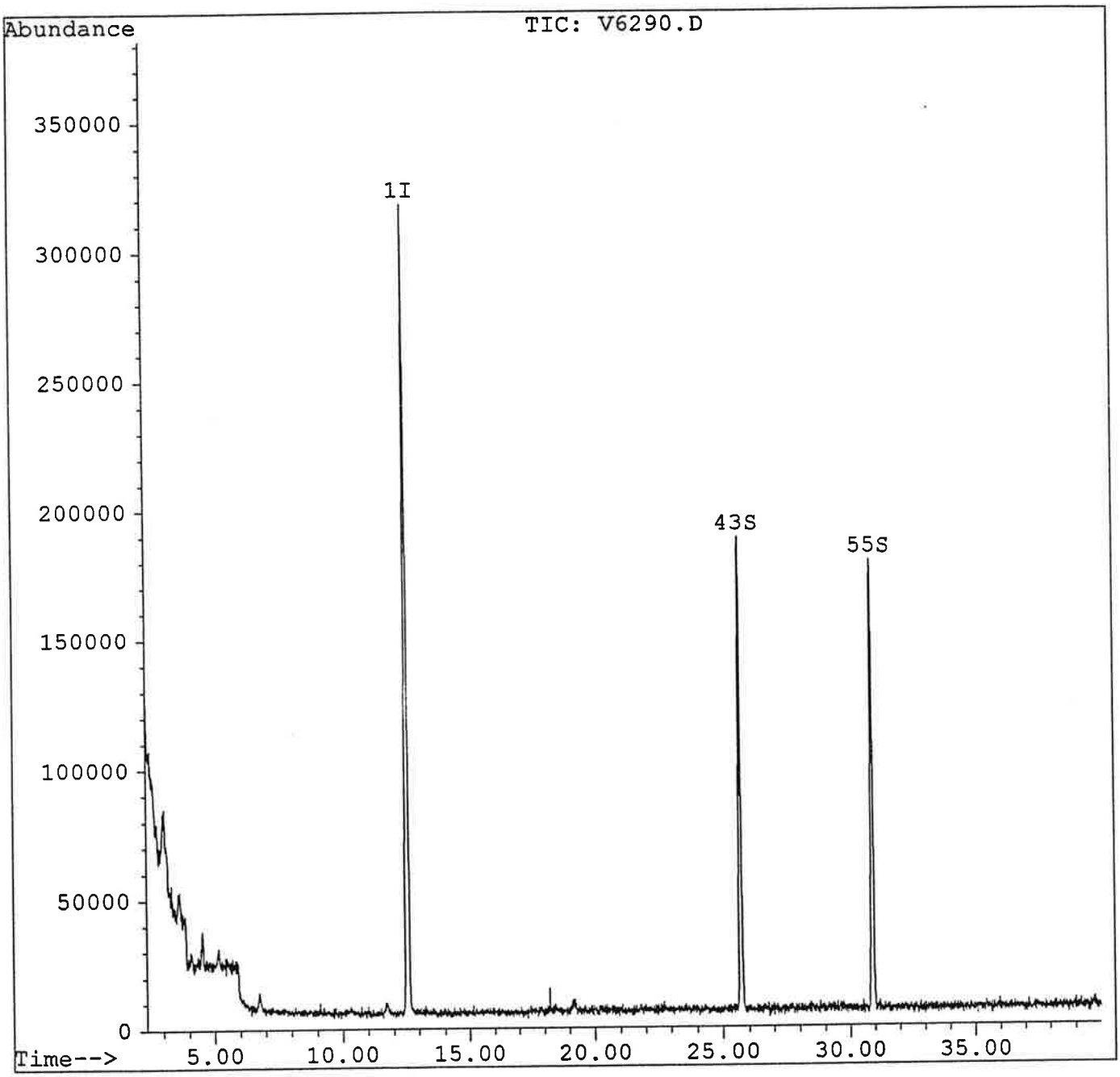
012

Quantitation Report

Data File : c:\hpchem\1\data\v6290.d
Acq On : 23 Jul 99 3:55 pm
Sample : R-6267.4
Misc : AHA - RC-EL-12-0799
Quant Time: Jul 26 9:10 1999

Vial: 12
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6291.d
Acq On : 23 Jul 99 4:42 pm
Sample : R-6267.5
Misc : AHA - RC-EC-71-0799
Quant Time: Jul 26 9:10 1999

Vial: 13
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.56	96	839688	5.00	ug/L	0.00
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.69	95	226420	5.15	ug/L	103.03%
55) 1,2-dichlorobenzene-d4	30.92	152	141637	5.18	ug/L	103.55%
Target Compounds						Qvalue

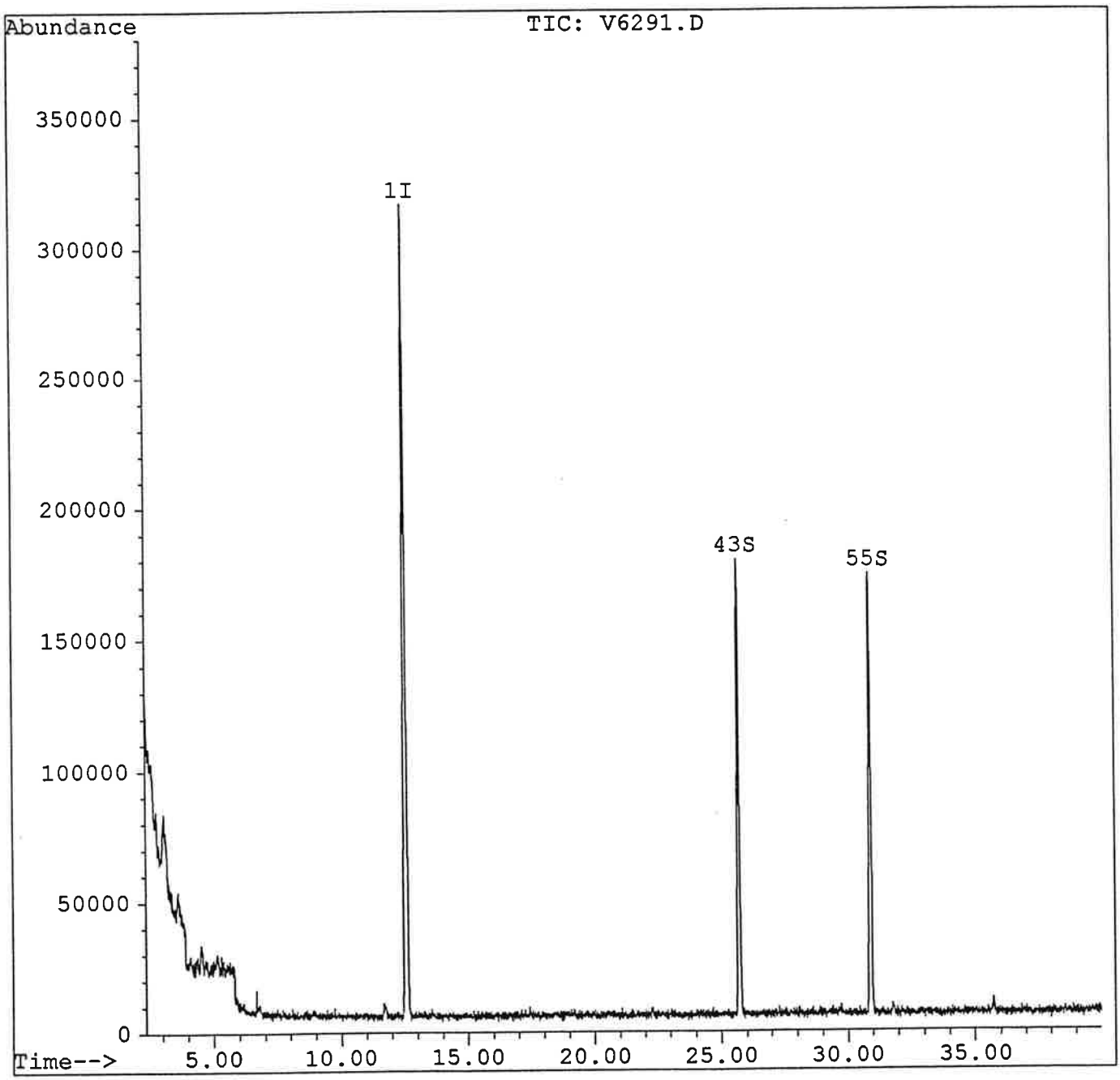
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6291.d
Acq On : 23 Jul 99 4:42 pm
Sample : R-6267.5
Misc : AHA - RC-EC-71-0799
Quant Time: Jul 26 9:10 1999

Vial: 13
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6292.d
Acq On : 23 Jul 99 5:27 pm
Sample : R-6267.6
Misc : AHA - RC-EC-35-0799
Quant Time: Jul 26 9:11 1999

Vial: 14
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.54	96	905814	5.00	ug/L	-0.02
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.68	95	244932	5.17	ug/L	103.31%
55) 1,2-dichlorobenzene-d4	30.90	152	150055	5.08	ug/L	101.69%
Target Compounds						Qvalue

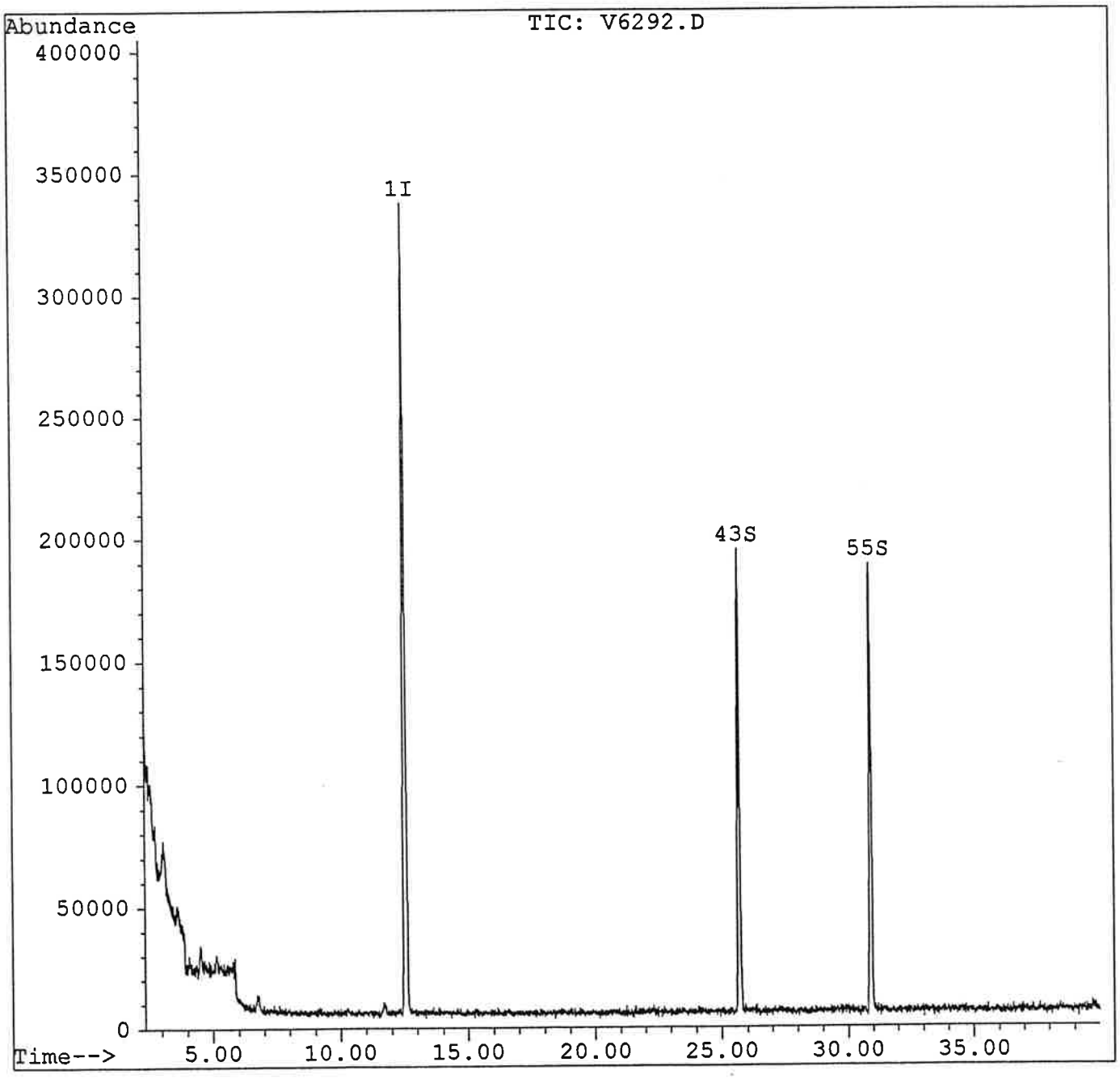
(#) = qualifier out of range (m) = manual integration
v6292.d RUN524.M Mon Jul 26 09:11:19 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6292.d
Acq On : 23 Jul 99 5:27 pm
Sample : R-6267.6
Misc : AHA - RC-EC-35-0799
Quant Time: Jul 26 9:11 1999

Vial: 14
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6293.d
Acq On : 23 Jul 99 6:14 pm
Sample : R-6267.7
Misc : AHA - RC-EC-00-0799
Quant Time: Jul 26 9:11 1999

Vial: 15
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	12.55	96	848054	5.00 ug/L	0.00
System Monitoring Compounds					%Recovery
43) 4-bromofluorobenzene	25.69	95	224573	5.06 ug/L	101.18%
55) 1,2-dichlorobenzene-d4	30.90	152	136328	4.93 ug/L	98.68%

Target Compounds Qvalue

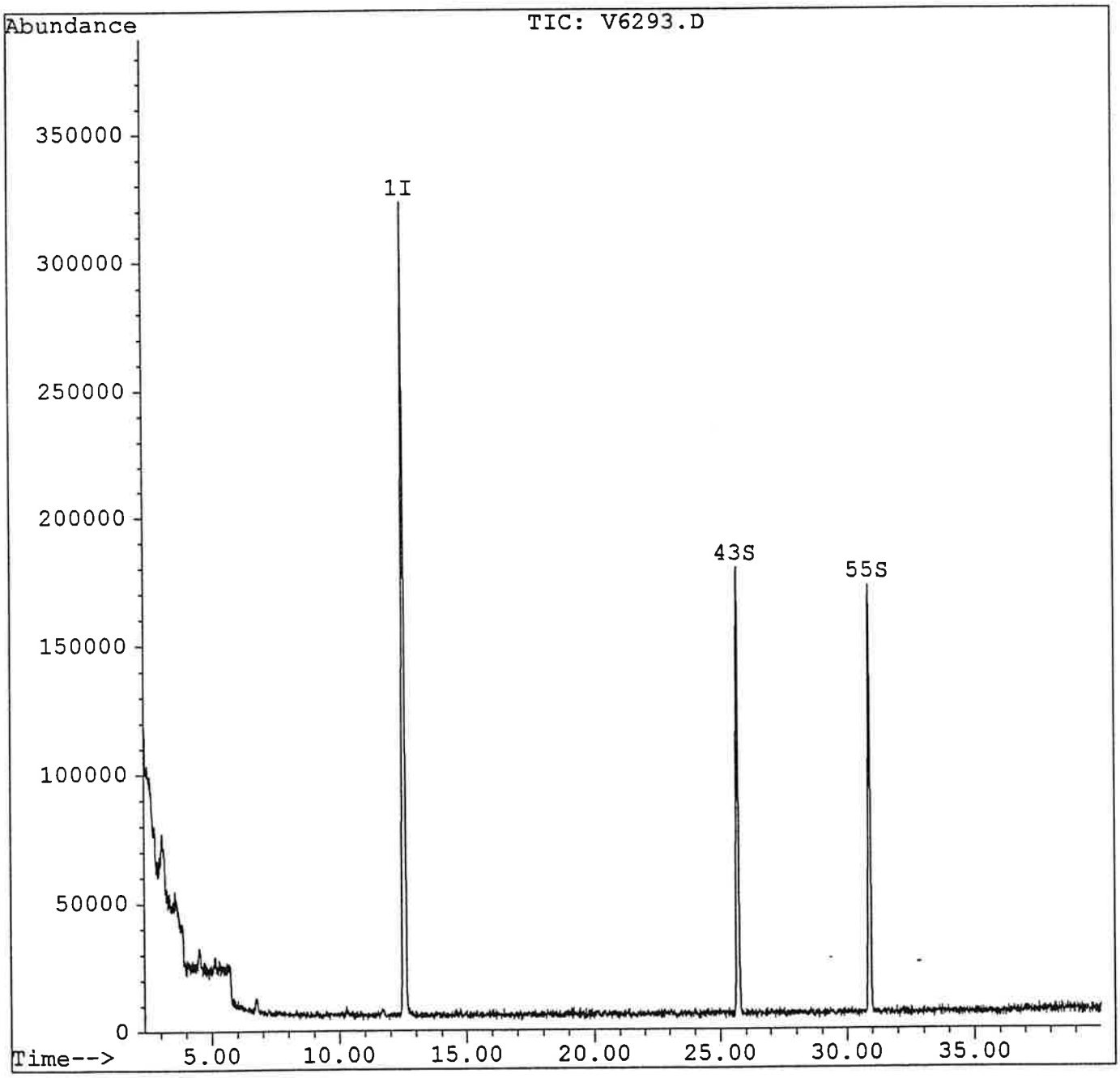
(#) = qualifier out of range (m) = manual integration
v6293.d RUN524.M Mon Jul 26 09:11:41 1999

Quantitation Report

Data File : c:\hpchem\1\data\v6293.d
Acq On : 23 Jul 99 6:14 pm
Sample : R-6267.7
Misc : AHA - RC-EC-00-0799
Quant Time: Jul 26 9:11 1999

Vial: 15
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : c:\hpchem\1\data\v6294.d
Acq On : 23 Jul 99 7:01 pm
Sample : R-6267.8
Misc : AHA - RC-EC-00-0799A
Quant Time: Jul 26 9:11 1999

Vial: 16
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	12.55	96	839260	5.00 ug/L	0.00
System Monitoring Compounds					%Recovery
43) 4-bromofluorobenzene	25.69	95	227812	5.19 ug/L	103.71%
55) 1,2-dichlorobenzene-d4	30.90	152	139566	5.10 ug/L	102.09%
Target Compounds					Qvalue

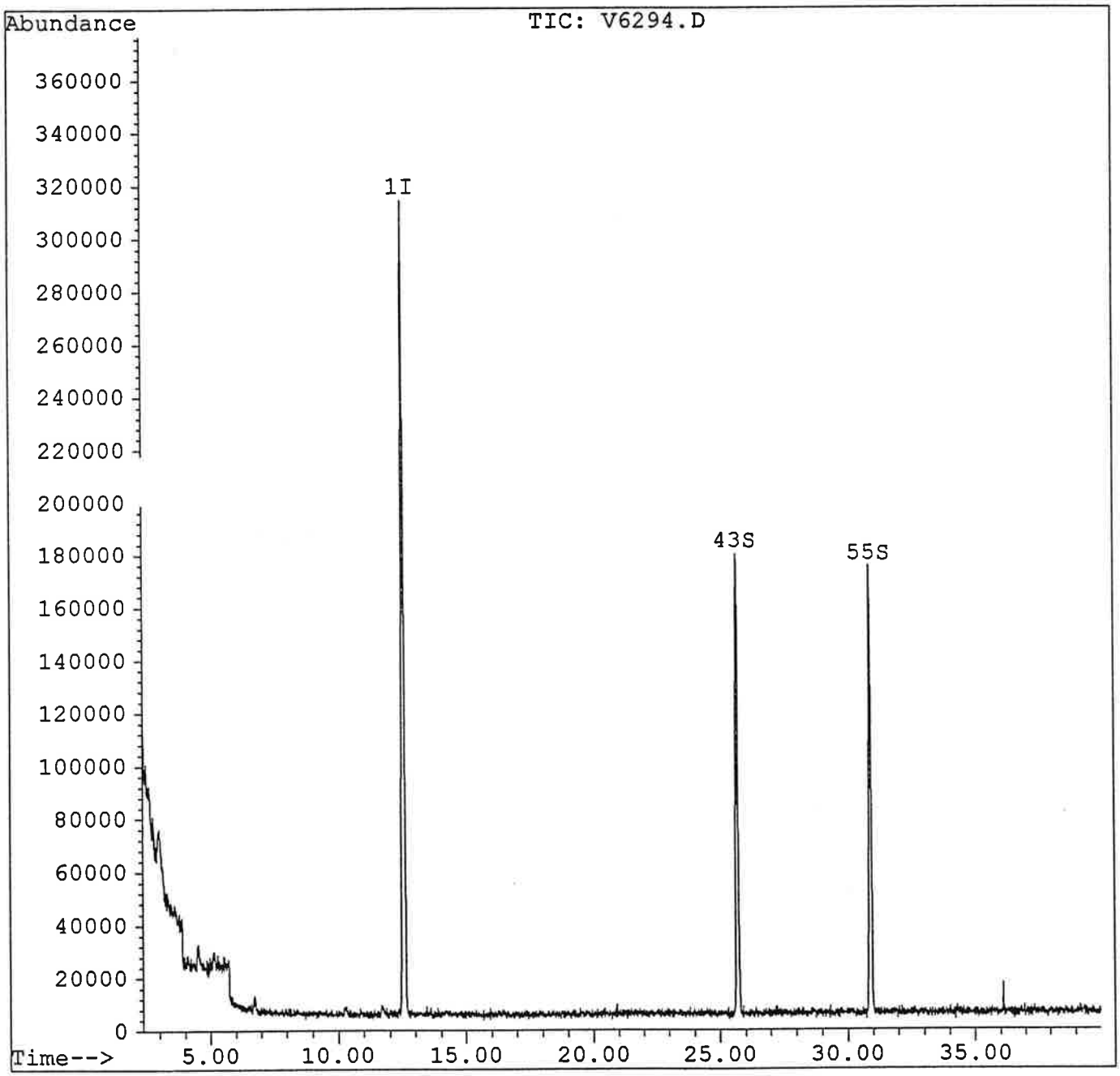
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6294.d
Acq On : 23 Jul 99 7:01 pm
Sample : R-6267.8
Misc : AHA - RC-EC-00-0799A
Quant Time: Jul 26 9:11 1999

Vial: 16
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



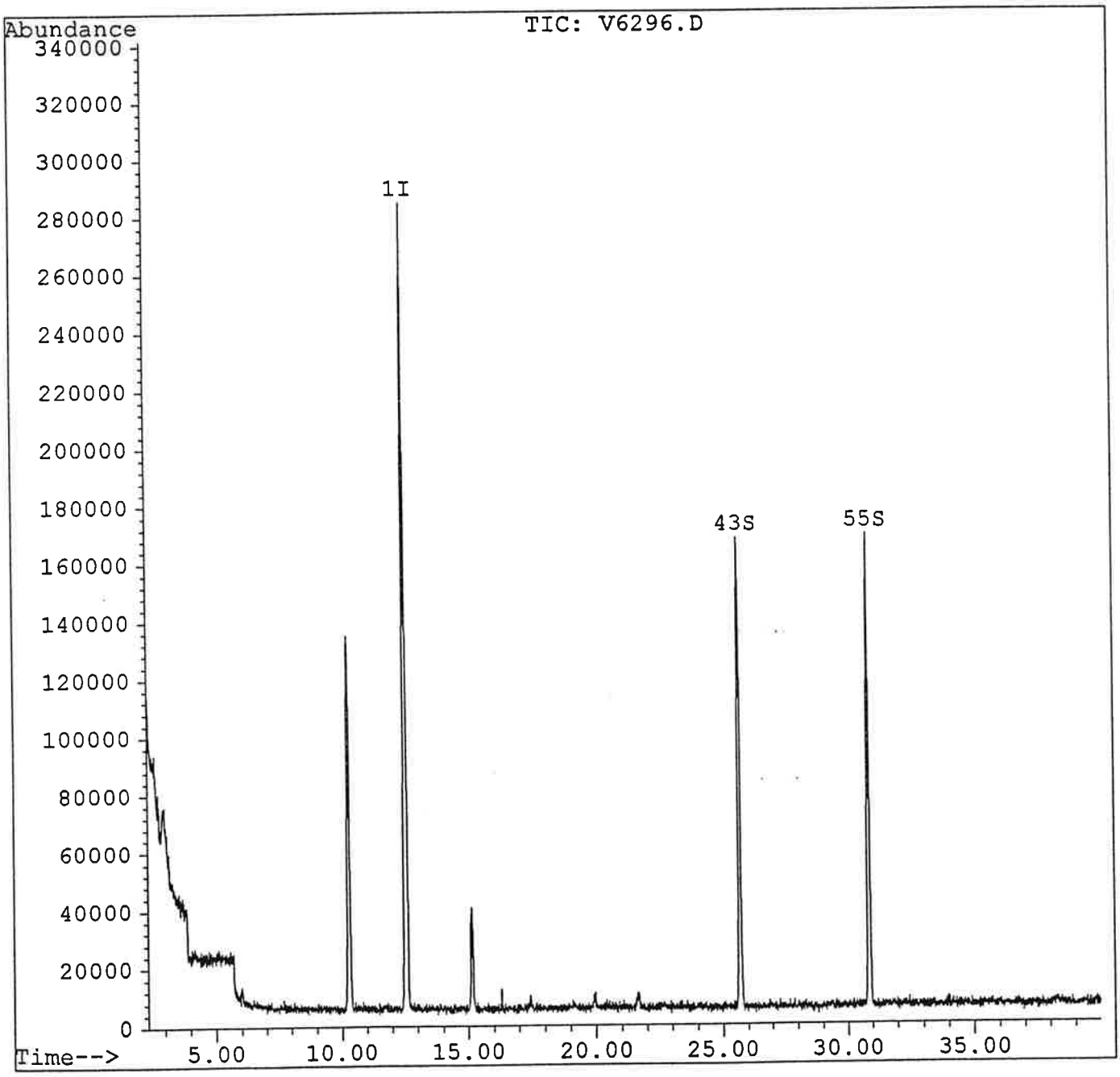
121

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6296.D
Acq On : 23 Jul 99 8:34 pm
Sample : R-6267.10
Misc : AHA - Trip Blank
Quant Time: Jul 26 10:14 1999

Vial: 4
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6295.D
Acq On : 23 Jul 99 7:47 pm
Sample : R-6267.9
Misc : AHA - Rinsate Blank
Quant Time: Jul 26 10:15 1999

Vial: 3
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.54	96	805721	5.00	ug/L	-0.02
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.69	95	227201	5.39	ug/L	107.74%
55) 1,2-dichlorobenzene-d4	30.90	152	142647	5.43	ug/L	108.68%
Target Compounds						Qvalue

(#) = qualifier out of range (m) = manual integration

RELIANCE LABORATORIES, INC.

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Customer : Lyondell

	SAMPLE NO.	SMC1 #	SMC2 #	#	OTHER #	TOT OUT
01	VBLK01	97	100			
02	R-6267.1	102	102			
03	R-6267.2	102	103			
04	R-6267.3	101	101			
05	R-6267.4	105	105			
06	R-6267.5	103	104			
07	R-6267.6	103	102			
08	R-6267.7	101	99			
09	R-6267.8	104	102			
10	R-6267.9	108	112			
11	R-6267.10	109	109			
12	VBLK02	118	122 *			
13	R-6267.1MS	98	100			
14	R-6267.1MSD	97	96			
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

QC LIMITS

SMC1 = 4-Bromofluorobenzene (80-120)
SMC2 = 1,2-dichlorobenzene-d4 (80-120)

\# Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-1

RELIANCE LABORATORIES, INC.

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Matrix Spike - Sample No.: R-6267.1

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Benzene	3.00	0.00	2.89	96	(80-120)
Toluene	3.00	0.00	2.82	94	(80-120)
Ethylbenzene	3.00	0.00	2.95	98	(80-120)
m&p-xylenes	3.00	0.00	2.91	97	(80-120)
o-xylenes	3.00	0.00	2.93	98	(80-120)
Styrene	3.00	0.00	2.90	97	(80-120)

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	3.00	2.88	96	0	20	(80-120)
Toluene	3.00	2.79	93	1	20	(80-120)
Ethylbenzene	3.00	2.92	97	1	20	(80-120)
m&p-xylenes	3.00	2.93	98	1	20	(80-120)
o-xylenes	3.00	2.89	96	1	20	(80-120)
Styrene	3.00	2.88	96	1	20	(80-120)

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Comments: _____

_____

RELIANCE LABORATORIES, INC.

VOLATILE METHOD BLANK SUMMARY

VBLK0

Customer : Lyondell

Lab File ID V6286.D

Lab Sample ID: BLANK1

Date Analyzed: 7/23/99

Time Analyzed: 1251

GC Column: DB-624 ID: 0.53 (mm)

Instrument ID: HP5971

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	R-6267.1	ER-68	V6287.D	1338
02	R-6267.2	ER-34	V6288.D	1423
03	R-6267.3	EL-24	V6289.D	1510
04	R-6267.4	EL-12	V6290.D	1555
05	R-6267.5	EC-71	V6291.D	1642
06	R-6267.6	EC-35	V6292.D	1727
07	R-6267.7	EC-00	V6293.D	1814
08	R-6267.8	EC-00A	V6294.D	1901
09	R-6267.9	RINSATE	V6295.D	1947
10	R-6267.10	TBLANK	V6296.D	2034
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV VOA

Quantitation Report

Data File : c:\hpchem\1\data\v6286.d
Acq On : 23 Jul 99 12:51 pm
Sample : blank
Misc : blank
Quant Time: Jul 26 9:08 1999

Vial: 8
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorobenzene	12.56	96	890100	5.00	ug/L	0.00
System Monitoring Compounds						%Recovery
43) 4-bromofluorobenzene	25.68	95	225933	4.85	ug/L	96.98%
55) 1,2-dichlorobenzene-d4	30.90	152	145114	5.00	ug/L	100.08%
Target Compounds						Qvalue

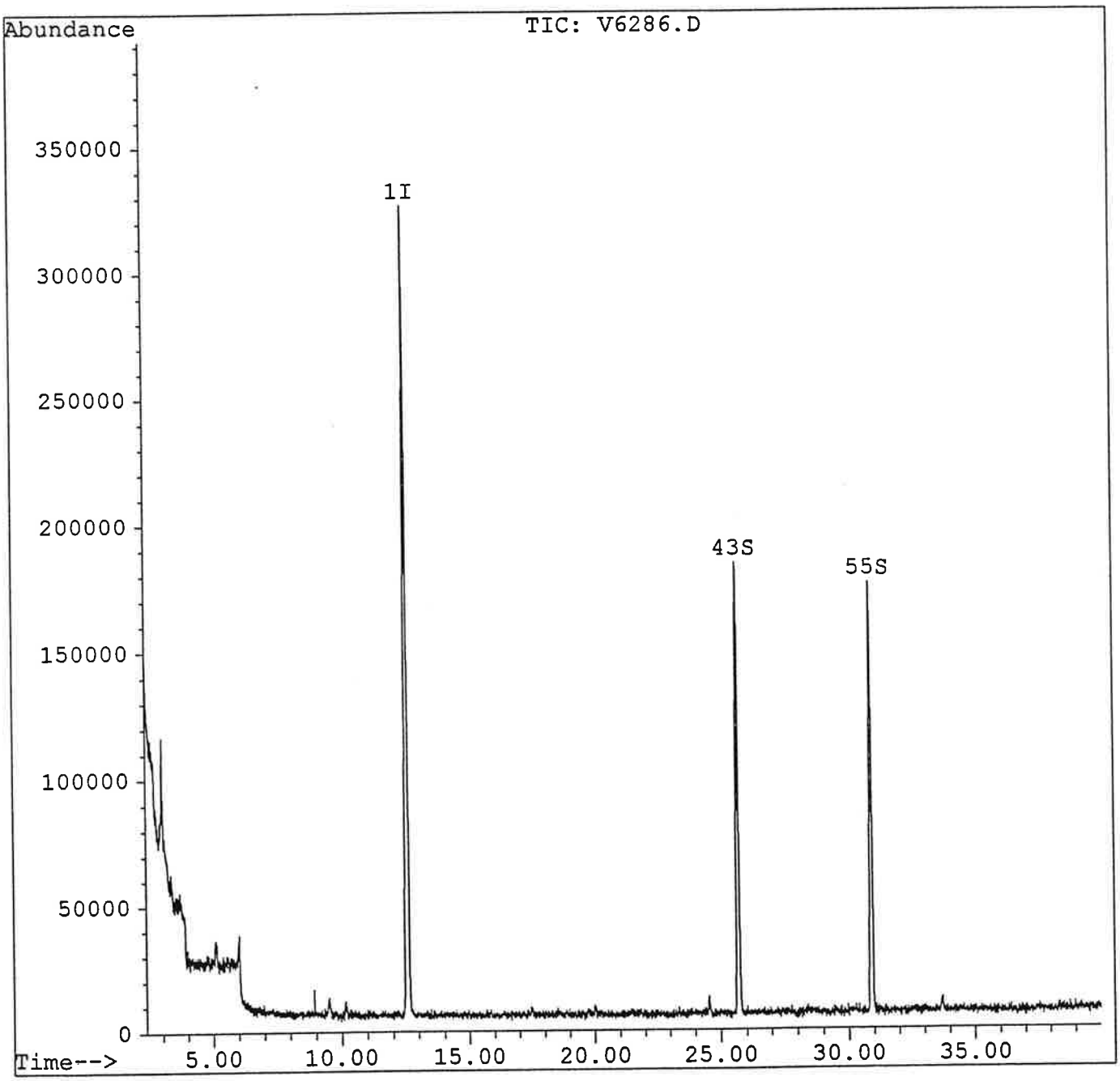
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : c:\hpchem\1\data\v6286.d
Acq On : 23 Jul 99 12:51 pm
Sample : blank
Misc : blank
Quant Time: Jul 26 9:08 1999

Vial: 8
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Mon Jul 26 09:07:31 1999
Response via : Multiple Level Calibration



RELIANCE LABORATORIES, INC.

VOLATILE METHOD BLANK SUMMARY

VBLK0

Customer : Lyondell

Lab File ID V6299.D

Lab Sample ID: BLANK2

Date Analyzed: 7/27/99

Time Analyzed: 1319

GC Column: DB-624 ID: 0.53 (mm)

Instrument ID: HP5971

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	R-6267.1MS	ER-68MS	V6300.D	1406
02	R-6267.1MSD	ER-68MSD	V6302.D	1620
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6299.D
Acq On : 27 Jul 99 1:19 pm
Sample : blank
Misc : blank
Quant Time: Jul 27 15:54 1999

Vial: 3
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Tue Jul 27 15:54:47 1999
Response via : Multiple Level Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	12.55	96	690549	5.00 ug/L	0.00
System Monitoring Compounds					%Recovery
43) 4-bromofluorobenzene	25.71	95	212666	5.88 ug/L	117.67%
55) 1,2-dichlorobenzene-d4	30.91	152	137186	6.10 ug/L	121.95%
Target Compounds					Qvalue

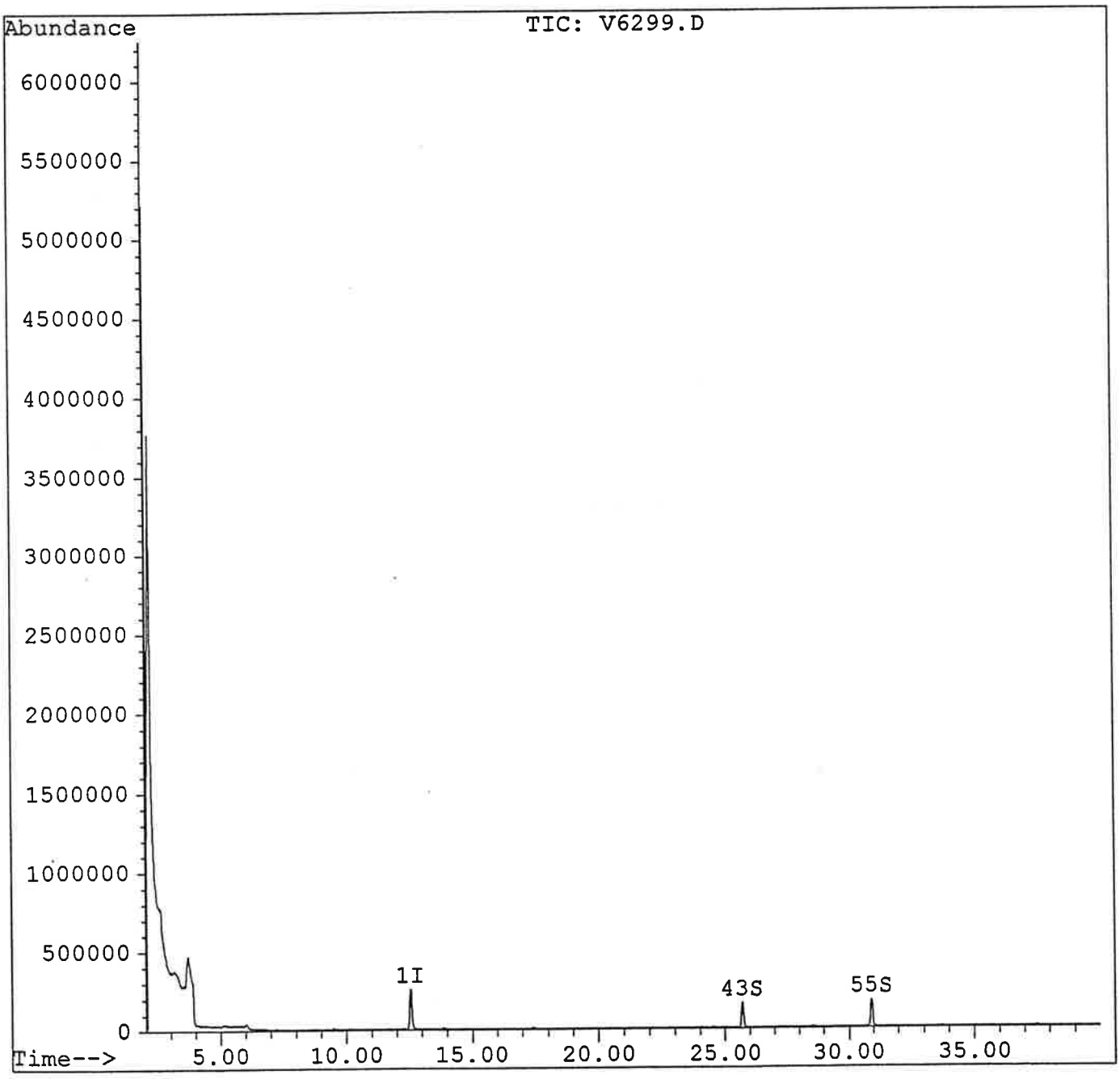
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\V6299.D
Acq On : 27 Jul 99 1:19 pm
Sample : blank
Misc : blank
Quant Time: Jul 27 15:54 1999

Vial: 3
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics
Last Update : Tue Jul 27 15:54:47 1999
Response via : Multiple Level Calibration



RELIANCE LABORATORIES, INC.

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Customer : Lyondell

Lab File ID: V6282.D

BFB Injection Date: 7/23/99

Instrument ID: HP5971A

BFB Injection Time: 0845

GC Column: DB-624 ID: 0.53 (mm)

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	19.9
75	30.0 - 66.0% of mass 95	48.4
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	63.2
175	4.0 - 9.0% of mass 174	4.7 (7.4)1
176	93.0 - 101.0% of mass 174	60.3 (95.5)1
177	5.0 - 9.0% of mass 176	4.0 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	ICC002	V6283.D	7/23/99	1010
02	VSTD005	ICC005	V6284.D	7/23/99	1058
03	VSTD001	ICC001	V6285.D	7/23/99	1144
04	VBLK01	BLANK1	V6286.D	7/23/99	1251
05	R-6267.1	ER-68	V6287.D	7/23/99	1338
06	R-6267.2	ER-34	V6288.D	7/23/99	1423
07	R-6267.3	EL-24	V6289.D	7/23/99	1510
08	R-6267.4	EL-12	V6290.D	7/23/99	1555
09	R-6267.5	EC-71	V6291.D	7/23/99	1642
10	R-6267.6	EC-35	V6292.D	7/23/99	1727
11	R-6267.7	EC-00	V6293.D	7/23/99	1814
12	R-6267.8	EC-00A	V6294.D	7/23/99	1901
13	R-6267.9	RINSATE	V6295.D	7/23/99	1947
14	R-6267.10	TBLANK	V6296.D	7/23/99	2034
15					
16					
17					
18					
19					
20					
21					
22					

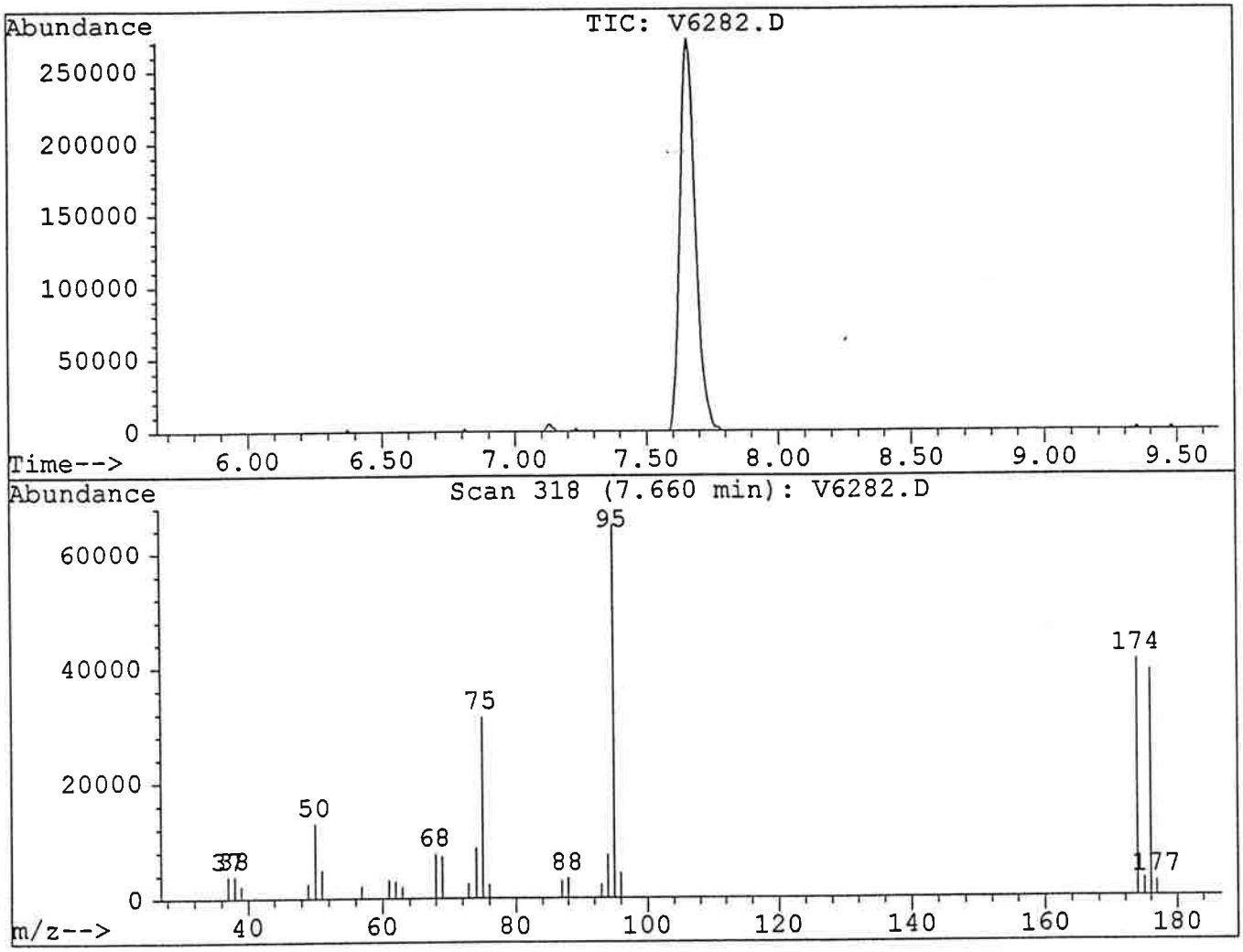
FORM V VOA

BFB

Data File : C:\HPCHEM\1\DATA\V6282.D
Acq On : 23 Jul 99 8:45 am
Sample : bfb
Misc :

Vial: 1
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics



Peak Apex is scan: 318

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	19.9	12924	PASS
75	95	30	80	48.4	31392	PASS
95	95	100	100	100.0	64920	PASS
96	95	5	9	6.5	4226	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	63.2	41000	PASS
175	174	5	9	7.4	3025	PASS
176	174	95	101	95.5	39144	PASS
177	176	5	9	6.6	2575	PASS

V6282.D RUN524.M Mon Jul 26 10:15:30 1999

RELIANCE LABORATORIES, INC.

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Customer : Lyondell

Lab File ID: V6297.D

BFB Injection Date: 7/27/99

Instrument ID: HP5971A

BFB Injection Time: 1107

GC Column: DB-624 ID: 0.53 (mm)

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	21.4
75	30.0 - 66.0% of mass 95	43.9
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.2
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	60.3
175	4.0 - 9.0% of mass 174	4.2 (6.9)1
176	93.0 - 101.0% of mass 174	59.3 (98.4)1
177	5.0 - 9.0% of mass 176	4.2 (7.2)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	CC0022	V6298.D	7/27/99	1225
02	VBLK02	BLANK2	V6299.D	7/27/99	1319
03	R-6267.1MS	ER-68MS	V6300.D	7/27/99	1406
04	R-6267.1MSD	ER-68MSD	V6302.D	7/27/99	1620
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

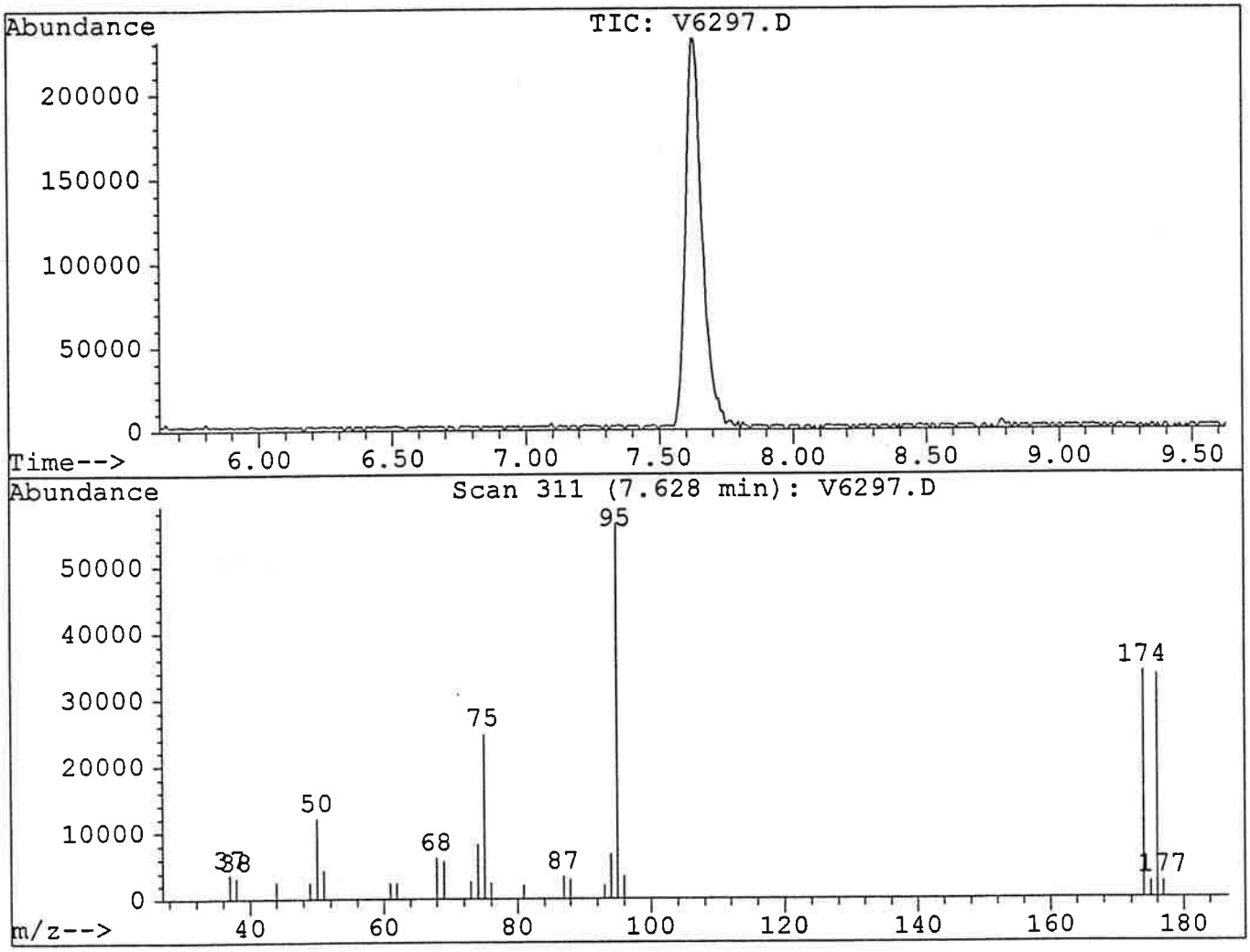
FORM V VOA

BFB

Data File : C:\HPCHEM\1\DATA\V6297.D
Acq On : 27 Jul 99 11:07 am
Sample : bfb
Misc :

Vial: 1
Operator: vb
Inst : 5971 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\RUN524.M
Title : 524.2 Purgable Organics



Peak Apex is scan: 311

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	21.4	12065	PASS
75	95	30	80	43.9	24752	PASS
95	95	100	100	100.0	56368	PASS
96	95	5	9	6.2	3468	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	60.3	33976	PASS
175	174	5	9	6.9	2351	PASS
176	174	95	101	98.4	33424	PASS
177	176	5	9	7.2	2393	PASS

V6297.D RUN524.M Tue Jul 27 15:51:09 1999

RELIANCE LABORATORIES, INC.

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Customer Lyondell

Instrument ID: HP5971A

Calibration Date(s): 7/23/99 7/23/99

Calibration Times: 1010 1144

GC Column: DB-624 ID: 0.53 (mm)

Lab File ID: RRF01 = V6285.D RRF02 = V6283.D
RRF05 = V6284.D

COMPOUND	RRF01	RRF02	RRF05			RRF (mean)	% RSD
Benzene	1.359	1.217	1.141			1.239	8.9
Toluene	1.338	1.085	0.987			1.137	15.9
Ethylbenzene	1.288	1.134	1.075			1.166	9.4
m&p-xylenes	0.893	0.785	0.750			0.809	9.2
o-xylene	0.934	0.790	0.746			0.823	11.9
Styrene	0.649	0.560	0.540			0.583	10.0
4-bromofluorobenzene	0.265	0.255	0.265			0.262	2.2
1,2-dichlorobenzene-d4	0.166	0.160	0.162			0.163	1.9

FORM VI VOA

RELIANCE LABORATORIES, INC.

VOLATILE CONTINUING CALIBRATION CHECK

Customer : Lyondell

Instrument ID: HP5971A   Calibration Date: 7/27/99   Time: 1225

Lab File ID: V6298.D   Init. Calib. Date(s): 7/23/99 7/23/99

Init. Calib. Times: 1010 1144

GC Column: DB-624   ID: 0.53 (mm)

COMPOUND	$\overline{RRF}$	RRF20	MIN RRF	%D	MAX %D
Benzene	1.239	1.191		3.9	
Toluene	1.137	1.107		2.6	
Ethylbenzene	1.166	1.173		-0.6	
m&p-xylenes	0.809	0.818		-1.1	
o-xylene	0.823	0.804		2.3	
Styrene	0.583	0.564		3.3	
4-Bromofluorobenzene	0.262	0.252		3.8	
1,2-dichlorobenzene-d4	0.163	0.157		3.5	

All other compounds must meet a minimum RRF of 0.010.

RELIANCE LABORATORIES, INC.

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Customer : Lyondell

Lab File ID (Standard): V6298.D

Date Analyzed: 7/27/99

Instrument ID: HP5971A

Time Analyzed: 1225

GC Column: DB-624 ID: 0.53 (mm)

		IS1 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	878256	12.55				
	UPPER LIMIT	1756512	13.05				
	LOWER LIMIT	439128	12.05				
	SAMPLE NO.						
01	VBLK02	690549	12.55				
02	R-6267.1MS	857144	12.55				
03	R-6267.1MSD	865445	12.57				
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 = Fluorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk
* Values outside of QC limits.

FORM VIII VOA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certifies That

Reliance Laboratories, Inc.
3090 Wood Bridge Avenue
Edison, NJ 08837

having duly met the requirements of the

Regulations Governing Laboratory Certification
And Standards Of Performance N.J.A.C. 7:18 et. seq.

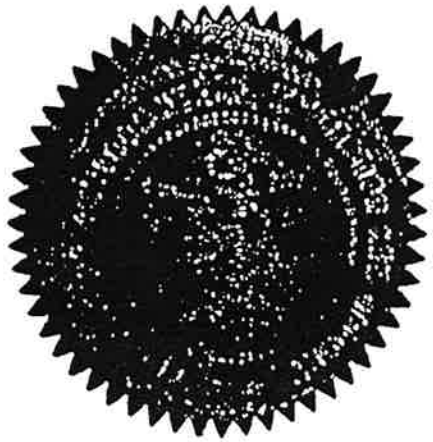
is hereby approved as a

State Certified Water Laboratory

To perform the analyses as indicated on the Annual Certified Parameter List which must accompany this certificate to be valid

12687
PERMANENT CERTIFICATION NUMBER

January 11, 1989
DATE



ACTING COMMISSIONER
DEPARTMENT OF ENVIRONMENTAL PROTECTION

This certification is subject to unannounced laboratory inspections as specified by N.J.A.C. 7:18-2.11(d) and agreed to by the Laboratory Manager on filing the application

TO BE CONSPICUOUSLY DISPLAYED AT THE LABORATORY WITH THE ANNUAL CERTIFIED PARAMETER LIST.

CHAIN OF CUSTODY

Applied Hydrology Associates, Inc.
400 Frankfort Rd, Monaca, Pa 15061

Customer: Lyondell Chemical
Address: 400 Frankfort Rd Monaca Pa. 15061
Phone (724) 728 - 6586
Fax: (724) 728 - 6498
E-Mail: b.petroff@worldnet.att.net

Date: 7/22/99
LAB ID: R-6267
Project ID: _____
Trun around time Standard
(stanrard / rush)
Fax results: Y N
E-Mail results: Y N

Sampler Name: BDP
Preserved Y N
Sample Intact: Y N

Sample ID	Date Spld.	Time Spld	# of containers	MATRIX: Water	MATRIX: Soil	MATRIX: Other	ORGANICS: EPA Test Method 524.2	ORGANICS: BTEX (602/8020)	ORGANICS: TPH (418.1)	ORGANICS: VOA (624/8260) + 15	ORGANICS: BNA / BN / + 15	ORGANICS: Pest / Herb	ORGANICS: PCB's	ORGANICS: TCLP Organics / pp + 40	ORGANICS: Other	METALS: TCLP / RCRA (8)	METALS: Priority Pol. (13)	METALS: Total Metals (list below)	METALS: Dissolved Metals	METALS: Other	OTHERS: pH / CN / Sulfide	OTHERS: Fl pt / % Solids	OTHERS: O & G / TSS / TOX	OTHERS: BOD / COD / TOC	OTHERS	OTHERS	Notes:
RC-ER-68-0799	7/22/99	10:44	1	x			x																				
RC-ER-34-0799	7/22/99	10:46	1	x			x																				
RC-EL-24-0799	7/22/99	10:55	1	x			x																				
RC-EL-12-0799	7/22/99	10:57	1	x			x																				
RC-EC-71-0799	7/22/99	10:48	1	x			x																				
RC-EC-35-0799	7/22/99	10:50	1	x			x																				
RC-EC-00-0799	7/22/99	10:52	1	x			x																				
RC-EC-00-0799A	7/22/99	10:53	1	x			x																				
Rinsate Blank	7/22/99	11:00	1	x			x																				
Trip Blank	7/22/99		1	x			x																				

Instructions: Please Fax results to Dave Smallwood (610) 565 - 3583 and Skip Meier: (303) 873 - 6110 and E-Mail results to Brian Petroff: b.petroff@worldnet.att.net

Submitted by: BDP
Agent of: AHA
Received by: [signature]
Agent of: Reliant
Date / Time: 7/22/99 0900

Submitted by: _____
Agent of: _____
Received by: _____
Agent of: _____
Date / Time: _____

Submitted by: _____
Agent of: _____
Received by: _____
Agent of: _____
Date / Time: _____

Report to: _____
Dellverables:
- [ ] Standard
- [ ] Reduced
- [ ] Customized

7/22/998:48 AM

AHA File name:
Chain of Custody for Raccoon Creek